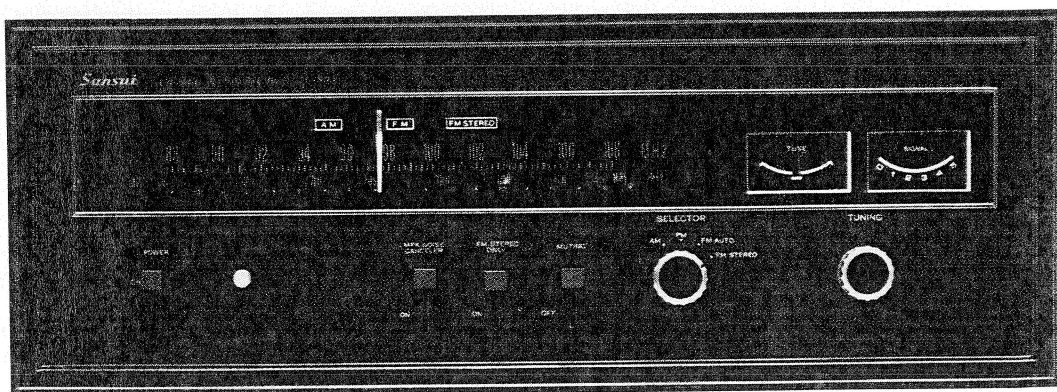


OPERATING INSTRUCTIONS & SERVICE MANUAL

SOLID-STATE AM/FM STEREO TUNER

SANSUI TU-999



Sansui

SANSUI ELECTRIC COMPANY LIMITED

Congratulations on joining the thousands of proud, satisfied owners of quality stereo components from Sansui.

The TU-999 is the most advanced professional solid state AM/FM stereo tuner ever manufactured by Sansui. As such, it incorporates the cream of our technology and long experience with audio equipment. Particularly, the FM tuner section is designed with the idea that FM broadcast is becoming an important program source which rates the same consideration as tapes and discs.

The FM front end with dual gate MOS FET and the IF amplifier stage with IC, a crystal filter and block filter together allow the tuner to offer unparalleled high sensitivity and stability, superior separation and low distortion characteristics.

The TU-999 also incorporates a number of special provisions designed to insure quality reception of FM stereo broadcasts. Such as an FM only switch, MPX noise canceler and an LC type leak filter with a sharp cutoff characteristic. And, of course, it comes complete with a full assortment of accessory circuits. Among them: an FM AGC level adjust switch, muting level adjustor, output level adjustor, two output terminals, and an AM/FM/FM Stereo indicator.

The TU-999 features the refined dull black panels common to all TU series professional tuners from Sansui. Together with the wide dial with twin tuning meters, linear dial scale for the FM band and a selflighting dial pointer, they make the tuner as smooth to the eye as it is to the ear.

The TU-999 comes with the full confidence and guarantee of the manufacturer. It is now up to you to read the contents of this manual carefully in order to operate it correctly and obtain the maximum performance it is capable of offering for many years to come.

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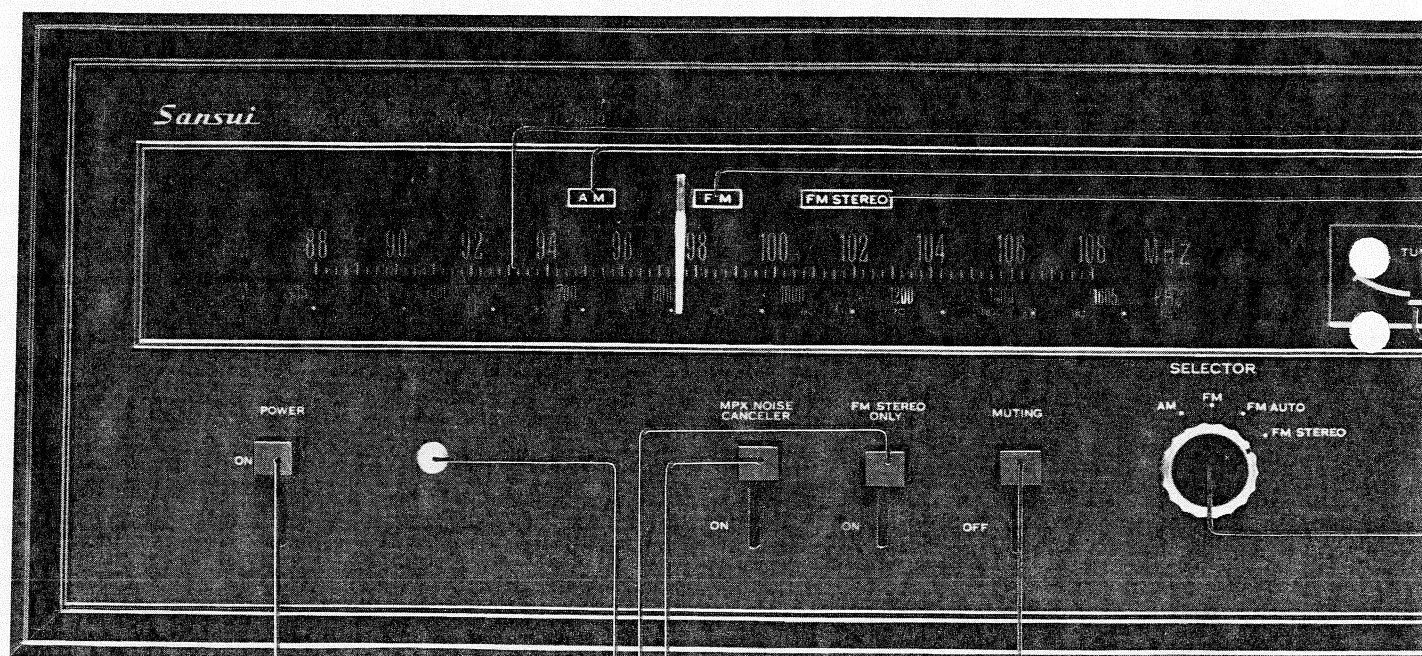
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SWITCHES AND CONTROLS



Power Switch

Set the lever in its up position to turn on the tuner. Set it in its down position to turn the tuner off. This switch controls not only the tuner but also the left AC outlet on the rear panel.

Power Indicator

This indicator glows when the Power switch is turned on. It remains lit while the tuner is on.

FM Stereo Only Switch

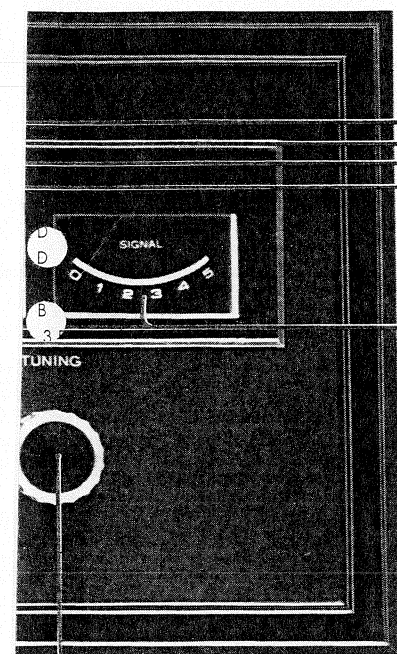
If you want to find an FM stereo station only, set this switch in its down position. The tuner receives FM stereo programs only.

Muting Switch

This switch suppresses interstation tuning noise when selecting FM stations. It should be used sparingly, particularly if the tuner is located in a weak signal area. When you want to pick up a weak station, this lever should be set to the OFF position.

MPX Noise Canceler

Noise accompanying FM stereo programs is reduced by turning this switch to the ON position. This switch should be set in its up position unless noise is heard, because it may reduce the channel separation slightly. Unlike the conventional noise filters, it does not attenuate treble tones at all.



Dial Scales

The upper large numbered dial is the FM station tuning dial. The lower small numbered dial is the AM station tuning dial. To select the desired station, turn the Tuning knob.

AM Indicator

This indicator is illuminated when the Selector switch is turned to the AM position.

FM Indicator

This indicator is illuminated when the Selector switch is turned to any FM position.

FM Stereo Indicator

This indicator lights up to give notice when a stereo program is being received. It is not illuminated for a monophonic FM program.

Tune/Signal Meters

These meters aid in pinpointing a station. The FM station is correctly tuned when the Signal meter needle swings as far to the right as it will go for maximum signal strength while the Tune meter is centered. For the AM stations, only the Signal meter can be used as described above.

Tuning Knob

Turn this knob to find the desired station. The two meters at the right of the dial scales aid in pinpointing the station.

Selector Switch

AM: Use this position for AM programs.

FM: Use this position for monophonic FM programs.

FM AUTO: With the switch in this position, the tuner selects between monophonic and stereo FM programs automatically depending on which program is being received.

FM STEREO: Use this position if stereo signal is too weak for the automatic switching.

OPERATIONS / MAINTENANCE

OPERATIONS

To receive AM broadcasts:

1. Turn the Selector switch to AM.
2. Select the desired AM station on the AM dial with the Tuning Knob. It is properly tuned when the needle in the Signal meter moves as far to the right as possible.

To receive FM broadcasts:

1. Turn the Selector switch to FM MONO for monophonic programs, to FM AUTO for both monophonic and stereo broadcasts, and to FM STEREO for only stereo broadcasts.

NOTE: If stereo reception is unstable with the Selector switch in the FM AUTO position, turn to FM STEREO.

If too much disturbing noise accompanies a stereo broadcast in either FM STEREO or FM AUTO positions, first switch the Noise Canceler on, and if the noise is still too disturbing, turn the Selector to FM MONO to hear the same broadcast monaurally.

2. Select the desired FM station on the FM dial with the Tuning Knob. It is properly tuned when the needle in the Signal meter moves as far to the right as possible while the Tune meter is centered. The FM Stereo Indicator glows automatically whenever an FM stereo broadcast is being received.
3. When too much interstation noise occurs during tuning, turn the Muting switch to its ON position.
4. If you want to hear FM stereo programs only, turn the FM Stereo Only switch to its ON position so that any monophonic programs are rejected.
5. It is best to adjust the output level of the tuner to match that of other components connected to the amplifier. This can be done by turning the LEVEL ADJ. control on the rear panel to either higher or lower level.

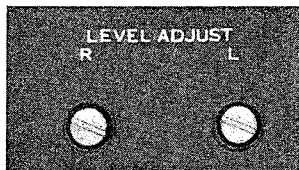
Muting Adjust Control

If a weak FM station that you want to receive cannot be heard when selecting it with the front Muting switch set in its ON position, turn this control clockwise with a screwdriver. To listen to strong FM stations only, turn it counterclockwise.



Level Adjust Controls

These controls allow separate adjustment of each channel output level of both FM and AM signals. To increase the output level, turn them clockwise with a screwdriver, and vice versa. Once these controls are set to match other components (a record player, for instance) connected to the amplifier, the Volume control on the amplifier need not be re-adjusted when the Selector switch is turned between the tuner and the record player.



FM AGC (Automatic Gain Control)

This switch is provided to automatically maintain a substantially constant output of FM signals in any area.

NORM.—Use this position if the tuner is located an average distance from the broadcasting stations.

LOC.—Use this position if the tuner is located near the broadcasting stations or in a strong signal area.

DIST.—Use this position if the tuner is located remote from the broadcasting stations or in a weak signal area.

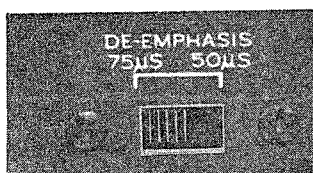


De-emphasis Switch

This switch is provided to restore the pre-emphasised FM signal to its original form.

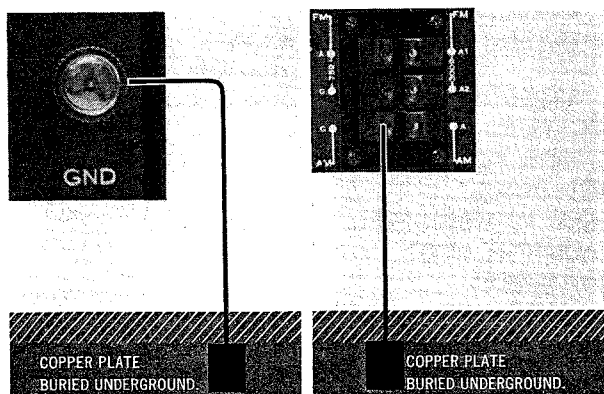
50 μ s—Set the switch to this position if the tuner is used in Japan or Europe.

75 μ s—Set the switch to this position if the tuner is used in U.S.A.



Grounding

Connect one end of vinyl or enameled wire to the terminal screw marked GND or AM-G on the rear of the tuner, attach a copper plate to the other end, and bury it underground. Whenever an outdoor AM antenna is used, grounding becomes necessary. In all cases, grounding is desirable since it allows a better SN ratio to be obtained.

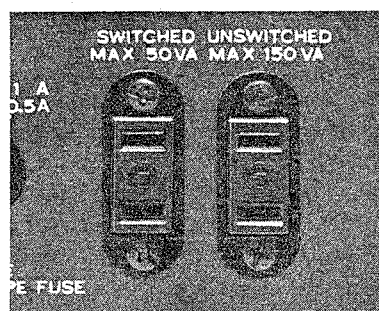


Where to Place

Since transistors are extremely susceptible to heat, the TU-999 has been designed to diffuse heat through the top and rear of its case. Therefore, special consideration should be given to where it will be used before installing the system. It should not be operated in a place where it is exposed directly to the sun, near radiators or other heat-generating sources, and it should never be mounted in an air-tight cabinet. Finally nothing should be placed on top of it.

AC Outlets

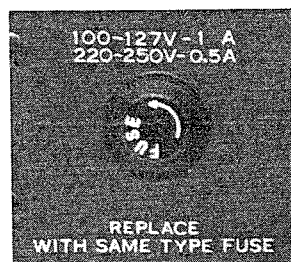
The TU-999 has been provided with two AC outlets on its rear panel. These outlets can be used as AC power sources for other components such as a turntable, but care should be taken not to use them for any component that exceeds their maximum rating. The power to the left switched outlet is controlled by the Power switch on the front panel.



Power Fuse

CAUTION: For the power supply voltage of 100 to 127 volts, use a 1 A fuse; for 220 to 250 volts, use a 0.5 A fuse.

If the tuner fails to operate when the power is switched on, its power fuse may be blown. To check, turn the fuse holder at the rear of the tuner to the left. If it is blown, disconnect the tuner from its power source and replace the fuse with an *identical 1 (or 0.5) A fuse*, after finding and eliminating the source of trouble that caused the fuse to blow. Using wire or a fuse of a different capacity as a stop-gap measure is dangerous and should be avoided. If the new fuse blows when the power is switched on again, contact your nearest Sansui dealer.

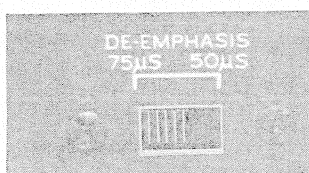


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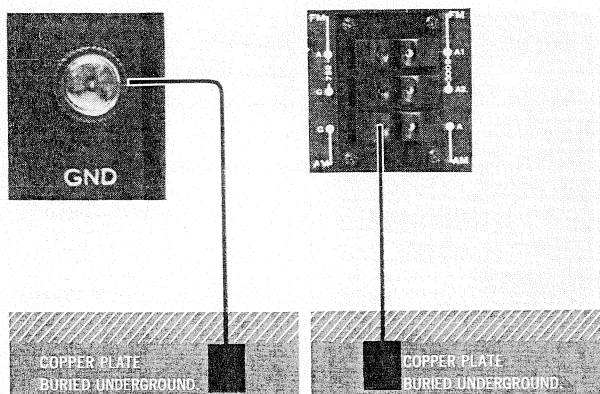
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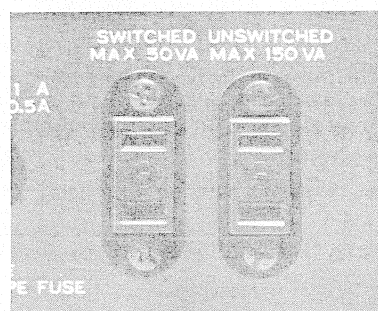


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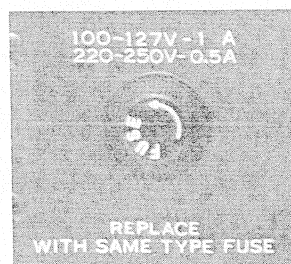
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MAINTENANCE/SPECIFICATIONS

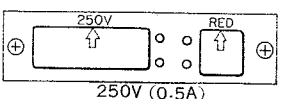
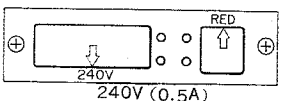
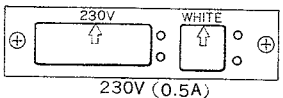
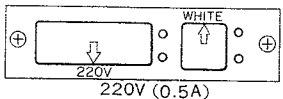
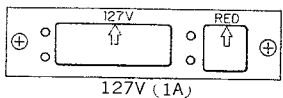
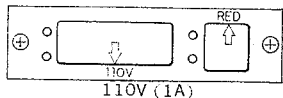
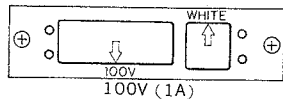
Voltage Adjustment

To reach the voltage selector, remove the two screws from the nameplate on the rear panel and then remove the nameplate. The voltage selector makes it possible to operate the TU-999 at the correct voltage in any area. The voltage has been pre-adjusted at the factory, but can be easily re-adjusted as follows:

STEP I Set arrow of main voltage selector plug to required voltage: 100, 110, 117, 127, 220, 230, 240 or 250 volts.

STEP II If numerals of voltage are printed in red, set arrow of adjacent sub V.S. plug to position marked red. If there are printed in white, set arrow to position marked white.

Note: The Voltage Adjustor can be also used to eliminate trouble caused by considerable voltage fluctuation. In this case, it should be set to the peak voltage.



FM SECTION

TUNING RANGE:	88 to 108MHz
SENSITIVITY (20 dB quieting):	1.4 μ V
(IHF):	1.8 μ V
TOTAL HARMONIC DISTORTION:	less than 0.5% (STEREO) less than 0.3% (MONO)
SIGNAL TO NOISE RATIO:	better than 65dB
SELECTIVITY:	better than 50dB
CAPTURE RATIO (IHF):	1.5dB
IMAGE FREQUENCY REJECTION:	better than 90dB
IF REJECTION:	better than 100dB
SPURIOUS RESPONSE REJECTION:	better than 100dB
STEREO SEPARATION:	better than 38dB at 400Hz
SPURIOUS RADIATION:	less than 34dB
ANTENNA INPUT IMPEDANCE:	300 ohms balanced, 75 ohms unbalanced

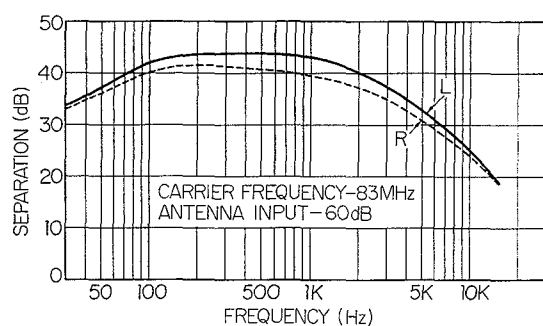
AM SECTION

TUNING RANGE:	535 to 1,605kHz
SENSITIVITY:	150 μ V at 1,000kHz (bar antenna)
SENSITIVITY (IHF):	30 μ V at 1,000kHz
IMAGE FREQUENCY REJECTION:	better than 80dB at 1,000kHz
SELECTIVITY:	better than 20dB at 1,000kHz
OUTPUT:	0 to 2V
TAPE REC:	0.4V
CONTROLS:	
FM MUTING LEVEL	
OUTPUT LEVEL	
SWITCHES:	
FM MUTING:	ON, OFF
MPX NOISE CANCELER:	OFF, ON
FM AGC:	DISTANT, NORMAL, LOCAL
SELECTOR:	AM, FM MONO, FM AUTO, FM STEREO
TRANSISTORS AND DIODES:	
Transistors;	37 FET; 3 I.C; 3 Zener Diodes; 2
Diodes;	23
POWER REQUIREMENTS:	
POWER VOLTAGE:	100, 110, 117, 127, 220, 230, 240, 250V 50/60Hz
POWER CONSUMPTION:	20W
DIMENSIONS:	17-1/8"W x 6-1/8"H x 12-1/2"D
WEIGHT:	22 lbs.

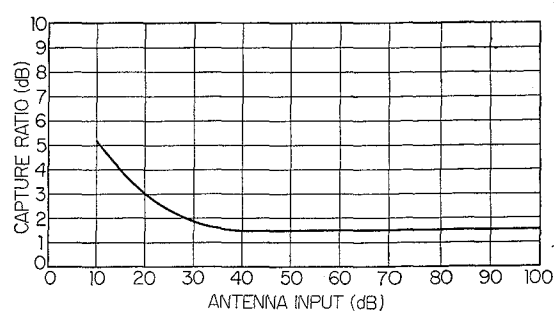
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CHARACTERISTICS

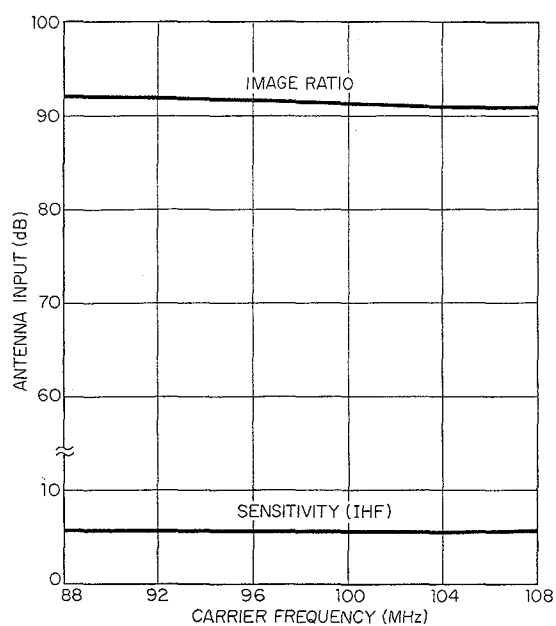
FM MPX SEPARATION



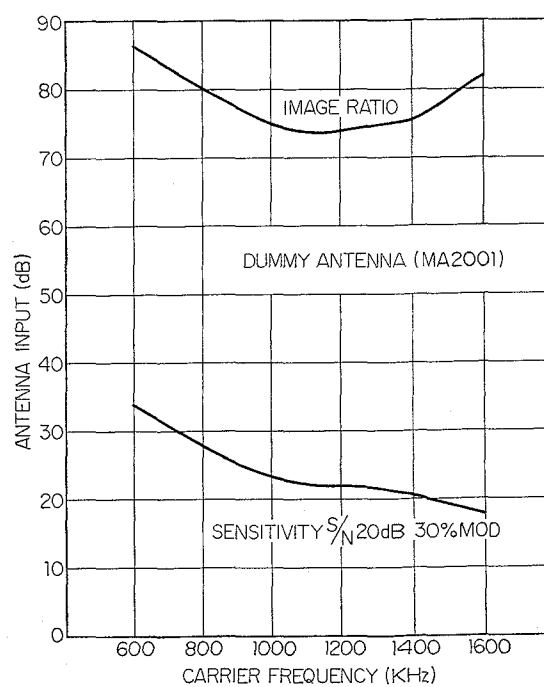
FM CAPTURE RATIO (IHF)



FM SENSITIVITY & IMAGE RATIO



AM SENSITIVITY & IMAGE RATIO



TROUBLESHOOTING CHART

This section has been prepared to help you quickly and correctly determine the causes, reasons and remedies in situations where your tuner does not perform satisfactorily. You will note that most of the causes result from improper handling or positioning of the receiver and not from internal defects. For situations that are not covered in this section however, and in instances where you are fairly sure that a breakdown in the tuner's circuitry has occurred, please consult your nearest Sansui dealer or our Service Center.

PROGRAM	SYMPTOM	PROBABLE CAUSE	WHAT TO DO
AM, FM or FM stereo reception	A. Constant or intermittent noise heard at times or in a certain area.	<ul style="list-style-type: none"> * Discharge or oscillation caused by electrical appliances, such as fluorescent lamps, TV sets, D.C. motors, rectifier and oscillator. * Natural phenomena, such as atmospheric statics, and thunderbolts. * Insufficient antenna input due to thick reinforced concrete walls of the building or long distances from the station. * Wave interference from other electrical appliances. 	<ul style="list-style-type: none"> * Attach a noise limiter to the electrical appliance that causes the noise, or attach it to the power source of the tuner. * Install an outdoor antenna and ground the tuner to raise the signal-to-noise ratio. * Reverse the power cord plug-receptacle connections. * If the noise occurs at a certain frequency, attach a wave trap to the ANT. input. * Keep the set at proper distance from other electrical appliances.
	B. The needle of the signal meter does not move well.	<ul style="list-style-type: none"> * The movement of the needle is one thing, the sensitivity of the tuner is another. 	<ul style="list-style-type: none"> * Tune the set for maximum signal strength.
	C. The zero point of the meter diverges much.	<ul style="list-style-type: none"> * Regional difference in field intensity. 	<ul style="list-style-type: none"> * The unit is not at fault.
AM reception	A. Noise heard at a particular time of a day, in a certain area or over a part of the dial.	<ul style="list-style-type: none"> * This results from the nature of AM broadcasts. 	<ul style="list-style-type: none"> * Install the antenna for maximum antenna efficiency. See "ANTENNA" in the operating instructions section. * In some cases, the noise can be eliminated by grounding the tuner or reversing the power cord plug-receptacle connections.
	B. High-frequency noise.	<ul style="list-style-type: none"> * Adjacent-channel interference or beat interference. * TV set too close to the audio system. 	<ul style="list-style-type: none"> * Although such noise cannot be eliminated, it is advisable to turn the amplifier's TREBLE control properly from midpoint to left and switch on the HIGH FILTER. * Keep the TV set at proper distance from the audio system.

PROGRAM	SYMPTOM	PROBABLE CAUSE	WHAT TO DO
FM reception	A. Noisy	* Poor noise limiter effect or too low SN ratio due to insufficient antenna input.	* Adjust the dipole wire antenna (supplied) for maximum signal strength. * If this does not prove effective, use an outdoor antenna designed exclusively for FM. When you use a TV antenna for both TV and FM with the help of a splitter, make sure the TV reception is not affected. * An excessively long antenna may cause noise.
	NOTE: FM reception is affected considerably by the conditions of transmission by stations: power and antenna efficiency. As a result, you may receive one station quite well while having difficulty in receiving another station.		
	B. A series of pops is heard.	* Ignition noise caused by the starting of an automobile engine and/or other motors.	* Install the antenna and its lead-in wire at proper distance from the road or raise the antenna input as described above.
	C. Tuning noise between stations.	* This noise results from the nature of FM reception. As the station signal becomes weak, the noise limiter effect is also decreased. The amplification of the limiter, in turn, is enlarged and thus a big noise is generated.	* Turn on the MUTING switch. In as much as it also reduces the sensitivity, it should be used sparingly.
FM stereo reception	A. Noise heard during FM stereo reception while not heard during FM mono reception.	* The service area of the FM stereo broadcast is only half as much as that of the FM mono broadcast.	* Install the antenna for maximum antenna input. * Switch the NOISE CANCELER to its ON position.
	B. Clearness of channel separation is decreased during the reception.	* Excess heat.	* Circulation of air is important to the tuner. Make sure that air can flow underneath.
	C. The stereo indicator blinks on and off.	* Interference	* The Indicator is not at fault. * Readjust VR ₅₀₂ .
	D. The stereo indicator blinks on and off even though a stereo station is not received.	* Interference	* The indicator is not at fault. * Readjust VR ₅₀₂ .